17 September 1958

MEMORANDUM FOR: Chief, TSS/PSD

THROUGH : AC/TSS/R&D
AC/TSS/TA

SUBJECT : Evaluation of the 35mm Time Lapse Camera

1. This division was requested by a memorandum from DC/TSS/PSD to C/TSS/ED dated 26 August 1958 to make an evaluation of the prototype 35mm time lapse camera developed by TSS/APD.

2. Attached herewith is a copy of this evaluation. For any additional information please contact [redacted] 25X1
[redacted] 25X1

[redacted] 25X1
Chief
TSS/Engineering Division

cc: [redacted] 25X1

DD/P/TSS/ED/[redacted] 25X1

~~SECRET~~ CONFIDENTIAL

17 September 1958

MEMORANDUM FOR THE RECORD

SUBJECT: Evaluation of the 35mm Time Lapse Camera

1. The purpose of this evaluation was to examine the 35mm time lapse camera from a mechanical point of view and make recommendations pertinent to the building of future models. It should be mentioned that no attempt has been made to consider the camera from a photographic or operational point of view except where it obviously effects design features.

2. The following comments are intended only as guideposts and it is realized that basic changes in part of the camera are already contemplated which will negate some of the following points. In addition the undersigned is not familiar with the design obstacles which have already been overcome, thus some of the following suggestions may not be realistic. This evaluation is written on the assumption that the reader is familiar with the camera.

f. Film Magazines

(a) The footage indicator arm on the 100, 200, and 400 foot magazines is made of a flexible metal. If this piece is bent the footage calibration will be off. (The indicator on the 400 foot magazine was received jammed and needs adjustment.) A rigid arm should be more accurate and lasting.

(b) The aluminum washers used under the magazine cover hold down fasteners are wearing rapidly (particularly in the 100 foot magazine) and should be replaced with a harder material.

(c) A lock washer is needed on the screw that secures the footage indicator post on the 100 foot magazine.

(d) The soft rubber gasket used to seal the magazine cover has already taken a set. It should be determined that this seal will not crack with age or allow light and moisture leaks.

(e) The film threading process would be simplified by having the film backing plate move out of the way by means of an interlock when the cover is removed. This would not be necessary if the loading process is not considered difficult.

CONFIDENTIAL

II. Sighting the Camera

(a) The frame sight on top of the camera is good; however, there is some confusion about which front frame to use when the rear sight has been positioned to correspond with a lens length. If the lens size and its reference line were placed on the same side of the scale, and the scales for the long and short lenses were placed one on each side of the slide track, the correct procedure would be more obvious.

(b) It is realized that the method of boresighting is difficult to use (particularly where the camera is mounted in an awkward position or must not be moved after aiming) and also that there are extreme space limitations between the film plane and the rear element of the 1" lens. For these reasons a compromise between the present system and permanent reflex viewer seems advisable. This is discussed in the following section "(c)".

The undesirable features of the present system are:

(1) The reflex device provided can not be secured rigidly or accurately to the camera body. A track for the existing tabs would help.

(2) The boresight button is tiring to hold down due to its small size. A lock-down feature would be desirable under field operational circumstances.

(c) If a complete set of lenses are to be supplied with the camera, it should be practical to modify the longer ones to accept a reflex device. Since the short lenses have a wider field of view, the camera does not need to be aimed as accurately, thus a conventional viewfinder (similar to the one provided on the camera) should suffice.

This may not be the best solution, but some simplified sighting method should be incorporated to reduce number of operations presently required.

III. Camera Shell

(a) The knobs on the interval and shutter switches were designed to be difficult to remove. This is accomplished by having a small access space in which a very small allen wrench must be inserted to loosen the set screws. There were no tools available to the undersigned and the side

CONFIDENTIAL

of the camera could not be removed to examine the timing gears, etc. Unless this anti-tamper feature is definitely needed, the above mentioned knobs could be made easier to operate by exposing them. A set of tools should be provided with the unit for simple maintenance purposes.

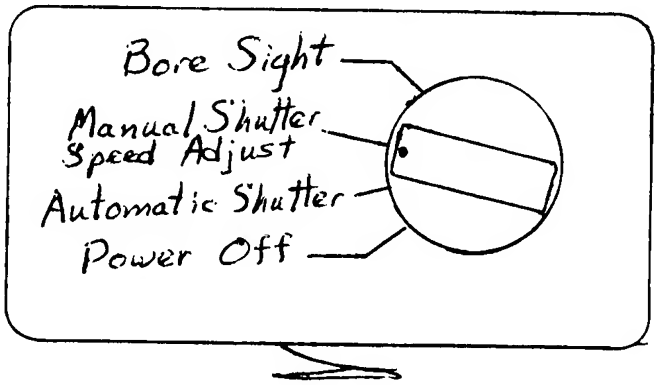
(b) The lens locking knob is very hard to use and should be marked with arrows to indicate which direction to turn in order to tighten or loosen.

(c) Several of the lenses had play in them when mounted. This probably does not affect the quality of the photographs; however, it should be eliminated if possible.

(d) To manually adjust the shutter speed, an unmarked knob must be unlocked by depressing it. The return spring on this knob is not strong enough to always return the knob to a positive lock position.

(e) There are several deficiencies which must be removed from the automatic shutter mechanism. This is the heart of the camera system and must be extremely reliable to render the camera useful. When the camera was first tested, reproducible shutter speeds could not be obtained for the same light intensity. This may have been caused by an underpowered servo motor, excessive friction, or interference in the drive mechanism. After further operation of the camera, the shutter would only go to 1/1600 second under all light conditions. The mechanism for turning the camera off when the light level is too low for a proper exposure is also not functioning. These conditions should be corrected and precaution taken to prevent their reoccurence.

(f) The label for the shutter control knob is a little ambiguous. The following label would be clearer to the operator:



IV. Power Supply

No evaluation was made of the batteries and radio switch. The type size weight etc. should be dictated by operational requirements Some means should be provided to enable the operator to tell when the battery charge is too low to satisfactorily operate the camera. Otherwise considerable operating time may be wasted in taking pictures at the wrong interval or at an incorrect exposure.

V. Instruction Manual

It is very important that the manual be as clear as possible since an experienced operator will not always be available to teach the use of the camera. There are places where the manual could be arranged better and a few additional points should be covered. Particularly, no mention is made in the bore sighting section that the shutter must first be manually opened to 1/50 second before sighting and that the power must be on. An additional section should be added giving name and number to each part used in operating the camera. A detailed parts list should also be provided for use in requesting replacement parts. Consideration should be given to providing certain spare parts and tools with the camera.

25X1

DD/P/TSS/ED

25X1

4.